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10/756,430	01/12/2004	Mark Edward Shaw	200313269-1	2158
22879 7590 09/04/2008 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400				
EXAMINER THOMPSON, JR, OTIS L				
ART UNIT 2619		PAPER NUMBER		
NOTIFICATION DATE 09/04/2008		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/756,430

Applicant(s)

SHAW ET AL.

Examiner

OTIS L. THOMPSON, JR

Art Unit

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

Response to Arguments

1. Applicant's arguments, filed July 24, 2008, with respect to claim 14 have been fully considered and are persuasive. The 35 U.S.C 112 rejection of claim 14 has been withdrawn.
2. Applicant's arguments with respect to the 35 U.S.C. 102 rejection of claims 1-4, 7-12, and 15-18 have been considered but are moot in view of the new ground(s) of rejection.
3. Applicant's arguments with respect to the 35 U.S.C. 103 rejection of claims 5, 6, 13, 14, and 19 have been considered but are moot in view of the new ground(s) of rejection.

DETAILED ACTION

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Van Doren (US 2001/0037435 A1).
6. **Regarding claim 1**, Van Doren discloses *a method of preventing a first partition of a partitionable computer system from transmitting a packet to a second partition of the partitionable computer system comprising:*

- a. *Receiving the packet from the first partition by a routing device* (Claim 1, see "...blocking messages originating in a first hard partition..."; Paragraph 0014, see "...multiprocessor building blocks are...interconnected by a switch fabric...crossbar switch...", i.e. crossbar switch is *routing device*), *the packet comprising a source address and a destination address* (Abstract, see "...each message transmitted by a source multiprocessor building block over the switch fabric has an appended routing word that specifies routing path..."; Paragraph 0012, see "...asserted bit of the routing word instructs the switch fabric to forward the message...to the location of the asserted bit within the vector [i.e. *destination address*]..."; Paragraph 0013, see "...multiple processor or building block IDs that may be associated with the message, such as a source processor ID [i.e. *source address*]...are compared...");
- b. *Reading the destination address of the packet* (Claim 9, see "...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose corresponding routing table entries are valid...", i.e. Routing table is check to make sure that the destination address of a message is within the same partition as the source address of the message);
- c. *Determining if the packet destination is within the first partition* (Claim 9, see "...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose

corresponding routing table entries are valid...”, i.e. Routing table is check to make sure that the destination address of a message is within the same partition as the source address of the message);

d. *Prohibiting transmission of the packet to the destination address when the destination address is not within the first partition* (Claim 1, see “...blocking messages originating in a first hard partition from entering a second hard partition...”).

7. **Regarding claim 2**, Van Doren discloses *comparing the destination address to a set of addresses in the first partition in a routing table* (Claim 9, see “...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose corresponding routing table entries are valid...”).

8. **Regarding claim 3**, Van Doren discloses *indexing a bit mask* (Paragraph 0048, see “...provides a routing mask that is append to the original packet...”; also see Paragraph 0055).

9. **Regarding claim 7**, Van Doren discloses that *the routing device is a crossbar* (Paragraph 0014, see “...multiprocessor building blocks are...interconnected by a switch fabric...crossbar switch...”, i.e. crossbar switch is *routing device*).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4, 8-12, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Doren.

12. **Regarding claim 4**, Van Doren discloses the claimed invention above but fails to specifically disclose that *prohibiting comprises dropping the packet*. However, this is an obvious modification since Van Doren prohibits communication between different multiprocessor partitions. As disclosed by Van Doren, this method results in a significant security feature of the system (Paragraph 0064). Thus, a message (i.e. *packet*) in the system that is prohibited from being communicated would have to be dropped or discarded because there is obviously nothing else that can be done with the message. The dropping feature would obviously decrease any possible congestion in the system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the teachings of Van Doren to incorporate the dropping or discarded of a prohibited packet in order to decrease congestion in the partitionable computer system.

13. **Regarding claim 8**, Van Doren discloses *a system for preventing a first partition of a partitionable computer system from transmitting a packet to a second partition of the partitionable computer system comprising:*

e. *A processor of the first partition configured to assemble the packet*

(Abstract, see "...each message transmitted by a source multiprocessor building

block over the switch fabric has an appended routing word that specifies routing path...", i.e. The message [i.e. *packet*] obviously originates from a processor within the multiprocessor building block [i.e. *first partition*], and the processor inherently assembles the message for transmission), *the packet comprising a source address and a destination address* (Abstract, see "...each message transmitted by a source multiprocessor building block over the switch fabric has an appended routing word that specifies routing path..."; Paragraph 0012, see "...asserted bit of the routing word instructs the switch fabric to forward the message...to the location of the asserted bit within the vector [i.e. *destination address*]..."; Paragraph 0013, see "...multiple processor or building block IDs that may be associated with the message, such as a source processor ID [i.e. *source address*]...are compared...");

f. *A transmitter in communication with the processor* (Figure 2 is an example of a quad building block [i.e. *partition*], see Paragraph 0026-0027; Figure 2, see unidirectional links 202, see Paragraph 0033; Figure 2, see I/O port connections 215, see Paragraph 0035; The transmitter in communication with the processors of the quad building block is the IOP interface circuit to which the I/O port connections 215 are connected), *the transmitter configured to transmit the packet* (IOP interface inherently transmits using the I/O port connections 215);

g. *A routing device that receives the packet comprising a port* (Paragraph 0014, see "...multiprocessor building blocks are...interconnected by a switch fabric, such as a hierarchical switch...preferably implemented as an 8-port

crossbar switch...”, i.e. crossbar switch is *routing device*), wherein the routing device does not send the packet to the destination address if the destination address is not within the first partition (Claim 9, see “...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose corresponding routing table entries are valid...”, i.e. Routing table is check to make sure that the destination address of a message is within the same partition as the source address of the message; Claim 1, see “...blocking messages originating in a first hard partition from entering a second hard partition...”).

Van Doren does not specifically disclose that *the routing device comprises a firewall*. Nevertheless, the routing device of Van Doren performs the function of a firewall, which is the function of restricting communication of packets between an external and internal system in order to significantly increase security. In this case, the systems comprise multiprocessor building blocks, or partitions, and a processor in a source partition is prohibited from communicating with a processor in a destination partition when the source and destination partitions are not the same. The incorporation of a firewall would be obvious over Van Doren because the aforementioned function is similar to the exact purpose of a firewall.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the teachings of Van Doren to incorporate a firewall into the crossbar switch in order to increase security in the system.

14. **Regarding claim 9**, Van Doren discloses that *the routing device is a crossbar* (Paragraph 0014, see "...multiprocessor building blocks are...interconnected by a switch fabric...crossbar switch...", i.e. crossbar switch is *routing device*).

15. **Regarding claim 10**, Van Doren discloses that *a routing table of destination address that are within the first partition* (Claim 9, see "...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose corresponding routing table entries are valid...").

16. **Regarding claim 11**, Van Doren discloses *a bit mask of addresses within the first partition* (Paragraph 0048, see "...provides a routing mask that is append to the original packet..."; also see Paragraph 0055).

17. **Regarding claim 12**, Van Doren discloses the claimed invention above but fails to specifically disclose *dropping the packet*. However, this is an obvious modification since Van Doren prohibits communication between different multiprocessor partitions. As disclosed by Van Doren, this method results in a significant security feature of the system (Paragraph 0064). Thus, a message (i.e. *packet*) in the system that is prohibited from being communicated would have to be dropped or discarded because there is obviously nothing else that can be done with the message. The dropping feature would obviously decrease any possible congestion in the system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the teachings of Van Doren to

incorporate the dropping or discarded of a prohibited packet in order to decrease congestion in the partitionable computer system.

18. **Regarding claim 15**, Van Doren discloses *a routing device in communication with a first partition of a partitionable computer system configured to prevent the transmission of a packet between the first partition and a second partition comprising:*

h. *A port in communication with the first partition configured to receive the packet* (Paragraph 0014, see "...multiprocessor building blocks are...interconnected by a switch fabric, such as a hierarchical switch...preferably implemented as an 8-port crossbar switch...", i.e. crossbar switch is *routing device*; Figure 4, see each quad building block [QBB] connected the hierarchical switch HS 400, and each of the 8 ports connects to an individual QBB; (Abstract, see "...each message [i.e. *packet*] transmitted by a source multiprocessor building block over the switch fabric..."), *the packet having a source address and a destination address* (Abstract, see "...each message transmitted by a source multiprocessor building block over the switch fabric has an appended routing word that specifies routing path..."; Paragraph 0012, see "...asserted bit of the routing word instructs the switch fabric to forward the message...to the location of the asserted bit within the vector [i.e. *destination address*]..."; Paragraph 0013, see "...multiple processor or building block IDs that may be associated with the message, such as a source processor ID [i.e. *source address*]...are compared...");

- i. *Blocking the sending of the packet to the destination address if the destination address is not within the first partition* (Claim 9, see "...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose corresponding routing table entries are valid...", i.e. Routing table is check to make sure that the destination address of a message is within the same partition as the source address of the message; Claim 1, see "...blocking messages originating in a first hard partition from entering a second hard partition...").

Van Doren does not specifically disclose that *the routing device comprises a firewall associated with the port*. Nevertheless, the routing device of Van Doren performs the function of a firewall, which is the function of restricting communication of packets between an external and internal system in order to significantly increase security. In this case, the systems comprise multiprocessor building blocks, or partitions, and a processor in a source partition is prohibited from communicating with a processor in a destination partition when the source and destination partitions are not the same. The incorporation of a firewall would be obvious over Van Doren because the aforementioned function is similar to the exact purpose of a firewall.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the teachings of Van Doren to incorporate a firewall into the crossbar switch in order to increase security in the system.

19. **Regarding claim 16**, Van Doren discloses *a routing table of destination addresses that are within the first partition* (Claim 9, see "...asserting the respective valid bits of the routing table entries that correspond to the nodes that are part of the given hard partition...routing messages originating within the given hard partition only to nodes whose corresponding routing table entries are valid...").
20. **Regarding claim 17**, Van Doren discloses *a bit mask of addresses within the first partition* (Paragraph 0048, see "...provides a routing mask that is append to the original packet..."; also see Paragraph 0055).
21. **Regarding claim 18**, Van Doren discloses the claimed invention above but fails to specifically disclose *dropping the packet*. However, this is an obvious modification since Van Doren prohibits communication between different multiprocessor partitions. As disclosed by Van Doren, this method results in a significant security feature of the system (Paragraph 0064). Thus, a message (i.e. *packet*) in the system that is prohibited from being communicated would have to be dropped or discarded because there is obviously nothing else that can be done with the message. The dropping feature would obviously decrease any possible congestion in the system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the teachings of Van Doren to incorporate the dropping or discarded of a prohibited packet in order to decrease congestion in the partitionable computer system.

22. Claims 5, 6, 13, 14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Doren as applied to claims 1, 8, and 15 respectively above, and further in view of Baehr et al. (US 5,884,025).

23. **Regarding claims 5, 13, and 19**, Van Doren discloses the claimed invention above, but does not specifically disclose *transmitting a notification to the source address that the packet was dropped*.

However, Baehr et al. discloses a screening system in which transmitted packets may be dropped with or without an error message generated to the sender of the packet (Column 7 lines 10-15). This helps prevent attacks on the system (Column 7 lines 16-17). Although Baehr et al. is directed toward communication between private and public networks, the same firewall concept exists in Van Doren for the same security purposes. That concept is protecting an inside partition or network from communications that originate outside of the partition or network.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to incorporate the concept of notifying the sender of a dropped packet (Baehr et al.) into Van Doren in order to help prevent attacks in the system.

24. **Regarding claims 6 and 14**, Van Doren in view of Baehr et al. discloses that an error message may or may not be generated to a sender in the case of a dropped packet but does not specifically disclose *generating a time out by the source address when a response to the packet is not received within a specified time period*.

However, it is well known in the art for a sender (i.e. *source address*) to await a response to a transmission for only a predetermined amount of time (i.e. *time out*) in order to prevent the sender from having to wait forever to receive a response when the sender could be performing other processes. In the case of Dickey in view of Baehr et al., if no error message is generated to the sender when a packet is dropped, then the sender has to have some way to know when to move on to other processes and not continue to wait for a response to a dropped packet.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the system of Dickey in view of Baehr et al. to include a time out when no response is received within a specified time period in order to prevent the sender from having to wait forever to receive a response when the sender could be performing other processes.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dickey (US 6,959,352 B1) discloses a system and method for allowing non-trusted processors to interrupt a processor safely.

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OTIS L. THOMPSON, JR whose telephone number is (571)270-1953. The examiner can normally be reached on Monday to Thursday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chirag Shah can be reached on (571)272-3144. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Otis L Thompson, Jr./
Examiner, Art Unit 2619

August 27, 2008

/Chirag G Shah/
Supervisory Patent Examiner, Art Unit 2619